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ABSTRACT

This study examines the performance of 85 men and women in two motor learning tasks, which were identified as tasks usually performed better by women or alternatively, by men. Both men and women demonstrated best task learning when they believed that most members of their sex did well on the task, and when no evaluative judgments were made on their learning progress. Women enjoyed the tasks more when they were told the activities were ones which men did well rather than those in which women did well. When the tasks were described as jobs women could do well, both men and women saw them as more dependent on luck. Unexpected in this study was the fact that black men and women described themselves as more masculine on the Bem Sex-Role Inventory than did the whites. The race differences in this self-perception should be further investigated. The number of subjects in the study is small, but results are replicable. (Author/PFS)

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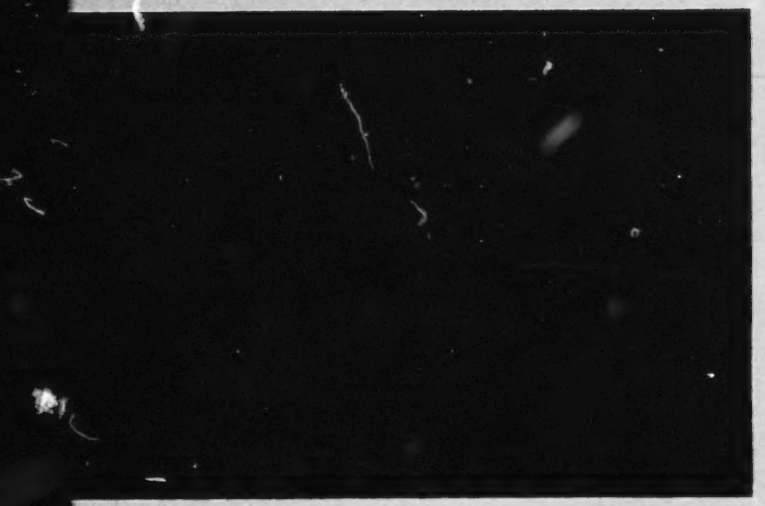

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Practice, Performance, and Sex: Sex-Role Appropriateness, Success, and Failure as Determinants of Men's and Women's Task Learning Capability

by

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Technical Report No. 1
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Men's and women's performance in two motor learning tasks was examined in an experimental learning situation in which unfamiliar tasks were identified as tasks in which men's performance was usually superior to women's, or alternatively, as tasks in which women's performance was usually superiod to men's. Both tasks were so structured that learners could keep track of performance improvement over time; learners were also given feedback by the experimenter describing success and failure in terms of comparisons of their performance with that

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of other individuals. Observations were made of learner's goal-setting, duration of voluntary practice, actual performance, and attributions of performance effectiveness by learners to ability, luck, effort, task difficulty, and sex.

Subjects were 85 Psychology I students at Temple University.

Results were that: (1) Both men and women demonstrated best task learning when they believed that most other members of their sex did well on the tasks they were learning and no evaluative comments were made on their progress in learning. Both men and women learned least well when they believed that even though most other members of their sex could do well at the task they were working on, their own learning progress was poor. However, men reacted to feedback describing their progress as poor by discounting the importance of the task as a measure of ability, and by emphasizing the importance of effort. Women accepted and believed in the negative evaluation of their performance capability. (2) Men performed better on a test trial than they had been performing during their practice just before the test. Women did more poorly on the test trial than they had been doing during their practice. (3) Women enjoyed the tasks more when they were described as activities which men did well than when they were described as activities women did well. When tasks were described as depending on masculine skills, both men and women saw them as demanding more effort for effective performance than when the same tasks had been described as dependent on feminine skills. When the tasks were described as jobs which usually women could do well, both men and women saw them as more dependent on luck. (4) Black men and women volunteers described themselves as more masculine on the Bem Sex-Role Inventory than did white men and women.

Results are interpreted in relation to men's and women's perception of achievement, methods of self-evaluation, and anxieties over performance evaluation by others. The race differences in self-perceptions relating to masculinity, unexpected in this study, are an outcome which should be investigated in further research.

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Dorothy McBride Kipnis

Louise H. Kidder

Our understanding of the similarities and differences between men's and women's approaches to work has yet to catch up with the fact that employers are suddenly recruiting women for positions that were previously held only by men. While some studies reveal parallels between masculine and feminine achievement behavior and attitudes (Veroff, Wilcox, and Atkinson, 1953), the parallels are not complete. Concepts and measures of men's achievement cannot be simply translated to investigations of women (French & Lesser, 1964; Hoffman, 1972; Klinger, 1966).

The failure to understand sex differences in achievement striving has created a void in the applicability of research findings to organizational regulation. Inasmuch as women either have already been included or are becoming included in a great many work organizations which were previously all male, it is increasingly important to gain an understanding of the similarities and differences between masculine and feminine approaches to work.

One theory of sex differences which looked promising for a while was based on Horner's (1968) concept of fear of success. Horner's thesis was basically an elaboration of the theory proposed by Atkinson (1964) for boy's and men's achievement motivation and behavior. She thought the same variables were important for women as for men, but added to the list a "fear of success" for women. She contended that women about to win in achievement testing situations, especially in competition with men, withdrew and failed to do their best work.

There are several questions about Horner's concept. For instance, perhaps fear of success is not a motivational deficit on the part of women but rather a realistic perception that women are likely to be punished for excelling in certain achievement-related activities (Monahan, Kuhn, and Shaver,

1974; Costrich, Feinstein, Kidder, Marecek, and Pascale, 1975). Another author has also argued that it is difficult to distinguish fear of success from fear of failure (Shaver, 1976).

In the study to be reported we have not attempted to measure fear of success by any of the techniques in current use. Instead, we have tried to compare men's and women's actual task performance following competitive success or competitive failure, and to combine observations of performance with an examination of men's and women's subjective explanations or causal attributions related to that performance.

Sex differences in causal attributions, or in men's and women's theories as to the variables which account for success and failure, appear to be related to sex differences in achievement activities (Deaux, Emswiller, 1974; Frieze, 1975; Falbo, Beck, and Melton, 1976). Sex differences in attributions include a defensive bias in boys which leads them to deny failure, and a self-derogatory bias in girls which leads them to credit failure more to lack of ability than they credit success to high ability (Nicholls, 1975). Women (more than men) may also attribute success to effort or luck (Deaux and Farris, 1974), or to external factors such as luck or the easiness of tasks to be done (Bar-Tal and Frieze, 1973; Simon and Feather, 1973), when they are fortunate enough to experience success.

Researchers interested in attribution theory and sex differences in self-evaluative processes have concentrated their effort on explanations of success and failure. They have overlooked the fact that what is experienced as success and what is experienced as failure are highly subjective phenomena in themselves. Furthermore, attribution theory, as originally conceived by Heider (1958), described a more general process. Attributions were expected to describe individual's theories of the causal relationships underlying

events as they appeared, not their appearance only. Two events identical in appearance might be perceived as stemming from different attributes if (a) the individuals perceiving them held different standards for evaluation, or different methods of defining that which was considered a success and that which was considered a failure, or (b) the actors engaging in the events differed in ways presumed to affect the likelihood of the event's appearance or outcomes.

Attributions about personal success or failure represent individual's accounts of the determinants underlying their own outcomes or performance proficiency. There is latitude in what a person might choose to regard as a success or as a failure; there is room for difference among individuals in what they choose to regard as the more important qualities underlying proficient performance, and finally, there are possible differences between individuals in the extent to which they regard general theories of causality or attributions to be applicable to themselves.

One explanation for sex differences in achievement motivation and behavior is that men and women attend to different kinds of information in evaluating themselves and their own performance (Kipnis, 1974; Veroff, 1977). As a result of different socialization experiences and different social milieus in adult life, men and women may acquire and apply different criteria when they evaluate their own proficiency. Men in American society typically have a lot of experience comparing their performance to that of other men or boys performing the same activity. Competitive athletics, competitive games, and even classroom performance can be evaluated through such interpersonal comparisons if one is attuned to it. Women are traditionally socialized in a more socially isolated or restricted fashion; they play fewer competitive games or the games that they do play are competitive only indirectly (Lever,

1976), they spend more time with adults (Bronfenbrenner, 1970; Long and Henderson, 1973), and parents or guardians protect girls from potentially unsuitable or threatening companions. Such different socialization histories might plausibly lead boys and men to evaluate their performance records through interpersonal comparison. Girls and women might use performance criteria embedded in task results themselves if their higher exposure to adult demands has led them to look for such results.

A second possible explanation for sex differences in achievement motivation and behavior is that performances enacted by men and women appear inherently different. If men's performances appear to reflect a different underlying series of variables because they come from men, or because the performance itself is sex-typed, while women's performances are presumed to reflect a different substratum simply because they come from women or are sex-typed as feminine, then sex-typing is a key feature of the attribution process.

If so, men and women may use different criteria to evaluate their own performance because they hold different theories about the performances of men and women in general. For example, if men's work is thought to feature strength and agility, or intelligence (ability), perhaps all who perform a man's job can credit greater ability to themselves as their performance improves, whether the performer is a man or a woman. Similarly, if women's work seems to entail patience and persistence (effort), all who succeed in mastering a task given a feminine job description may receive credit for "trying."

METHOD

The present study is an effort to disentangle the various explanations for sex differences in task performance, causal attributions, and self-

evaluations. We used two tasks at which performance was likely to improve with practice. The tasks gave the learners constant feedback about their proficiency. The experimenter (E) also gave the learners feedback about their proficiency compared with that of other people working on the same tasks. The E manipulated the sex-typing of the tasks by saying that either men or women typically performed better than members of the other sex on each of the tasks. All of the men and women practiced one task which they thought their own sex performed better and one which they thought the opposite sex did better.

Each of the men and women described the variables he or she felt accounted for good performance on each of the tasks. After a period of practice long enough to give the person an opportunity to formulate a judgment based on his/her own experience, each subject (S) was asked to describe the extent to which he/she thought performance on the task was determined by effort, ability, luck, the difficulty of the task itself, or sex. Finally, each man or woman described how well he/she had done on each of the two tasks. He/she also described how much effort he/she had put into learning the task and how much he/she had enjoyed it.

The first explanation for sex differences in achievement behavior was that men and women differ in the relative weights that they give to feedback derived from the task itself as compared with social comparison, or in our experiment, E's assessment of S's performance as compared with that of other individuals. Men were expected to give greater weight to social comparison in forming their self-evaluations while women were expected to base their self-evaluations more extensively on task feedback. One would expect such a difference in subjective aspects of self-evaluation to produce behavioral differences between men and women in the conditions under which they would

practice, their standards for their own performance, and the degree of proficiency with which they would content themselves in their task learning.

Our second explanation dealt with sex-typing of tasks and attributions of task performance according to sex-typing. If attributions of task performance differ according to sex-typing, it is possible that the impact of success or failure also varies according to sex-typing. Such a difference would be expected to be demonstrated by the application of different standards and evaluation processes to masculine and feminine tasks, and different reactions to evaluation by men and women according to the sex-appropriateness of the task they were performing.

Subjects

Subjects (S) were 85 Psychology I students, 43 males and 42 females, who volunteered in partial fulfillment of course requirements. When they signed up for the experiment, they knew only that it involved motor learning.

Early experience with volunteer rates with Ss of both sexes indicated that there was likely to be a racial difference which partially overlapped with S's sex: the great majority of the male Ss were white, but almost half of the female Ss were black. Because the relationship between race and sex differences is not at all understood at the present time, and because the appearance of the sex difference in race seemed to be an inevitable outcome of the composition of the Temple student body, we decided to record S's race and to use it in data analyses for post hoc comparisons. The small number of black men does not permit equivalent analyses for both sexes. However, the data analyses based on race gave rise to several interesting results.

Ss were assigned to conditions in rotating order, and variations in number of black and white women in the various conditions are at a chance level. The number of black and white Ss of each sex in each condition is

given in Appendix A.

Procedure

Two tasks were selected because they permitted indefinitely prolonged improvement or learning and because they gave the learner a continuous progress record in quantitative terms, should he or she choose to attend to it.

The first task, a pursuit rotor, is the standard laboratory task often used in experiments on motor learning. The pursuit rotor operated at four speeds, 15, 30, 45, or 60 revolutions per minute, with a 20 second rest period following each 20 second period of rotation. A timer registered the number of seconds Ss remained on target in each 20 second trial. These scores were easily visible to Ss at the conclusion of each trial; in addition, E read the score aloud as she recorded it.

The second task, a labyrinth, is a game sold in toy shops in which the player scores points by rolling a steel marble along a path on a tilting platform, avoiding holes beside the path through which the marble can fall. Each hole is numbered, and the score is the number of the hole reached when the marble drops down. The player guides the marble by tilting the track platform, controlling the direction and amount of tilt with two knobs which he manipulates, one with each hand.

The pursuit rotor had a feature which permitted data gathering on a variable which the labyrinth did not afford. Each person could select the degree of difficulty of the task he would attempt by regulating the speed of the turntable for each of his 20 second trials. The E demonstrated the slowest and fastest rates and told S that he could adjust the turntable for each trial to any of the four speeds.

The pursuit rotor was the first task for all Ss. Each person practiced for five 20 second trials. He/she then answered two questionnaire items,

one describing how well he/she was doing on a scale marked from poor to excellent, the other describing how much he/she was enjoying the task on a continuum ranging from "not at all" through "very much". E also asked S to judge the extent to which performance on the pursuit rotor reflected luck, effort, ability, task difficulty, or the sex of the person attempting it.

S then practiced for as long as he/she wished, selecting his/her own speeds for each trial. When Ss were satisfied with their performance, they notified E, who then conducted two final "test" trials at 45 and 60 rpm, set by E. After the two test trials, Ss again answered the questionnaire items describing how well they had done at learning the pursuit rotor, how much they had enjoyed it, and one added item describing how hard they had tried. S also repeated his/her judgments on how much performance depended on luck, effort, ability, task difficulty, or sex, and responded to a brief interview, to be described below.

E then continued to the second half of the experiment, the labyrinth task. After explaining the task, she permitted S to practice guiding the marble for 3 minutes, timed with a stop watch. She then asked S to answer the same questionnaire items that were used after the first practice period on the pursuit rotor.

S then practiced the labyrinth for as long as he/she wished, and notified E when he/she was satisfied with his/her performance. E then administered one last trial which was described as the score to be used for S's record. Again, S responded to the same questionnaire and interview items that were used at the termination of the pursuit rotor.

Finally, E briefly interviewed S about the two tasks and about S's own beliefs about sex differences on these and other tests, and administered Bem's Androgyny Scale or the Bem Sex-Role Inventory (Bem, 1974). E thanked

S for participating in the experiment, made it clear that the experiment was over, and explained and discussed the purposes of all features of the experiment, including the points at which deception was introduced. Ss were asked not to discuss the experiment with classmates as their classmates were possible future volunteers. No Ss gave any hint of knowing about experimental details up through the end of the data collecting period.

All data were obtained in individual experimental and testing sessions by two Es. Both Es were white women who were probably regarded by Ss as graduate students in psychology.

Sex-Appropriateness of Tasks

Both tasks were selected to be sufficiently novel that Ss would be unlikely to hold preconceived ideas of whether men or women would be likely to perform better on them. The E told half of the men and half of the women that women could usually perform better on the pursuit rotor than men. The other half of the men and women were told that men could usually perform better than women. When the pursuit rotor was described as a task at which women did better than men E demonstrated the pursuit rotor in operation, explained the timer, and then said "...This particular task has been used in research by a great many investigators. Generally speaking, it's a task at which women do better than men since it seems to be a measure of fine motor skills and manual dexterity of a very precise kind. Women seem to be outstanding in fine motor skills that take precise coordination just as men, on the average, outdo women in strength ... The pursuit rotor apparently demonstrates the kind of ability that is important for many of the occupational fields in which women do better than men, like those which require handling or assembling small, complex instruments and many types of clerical jobs. Bell Telephone Company, for example, has found from experience that

women are better able than men to put together the small, transistorized parts of the telephone." To describe the pursuit rotor as a masculine task, E said "... This particular task has been used in research by a great many investigators. Generally speaking, it is a task at which men can do better than women as it seems to involve coordination of eyes and hands or visual motor coordination. This is important in aiming, throwing or hitting in games like baseball or basketball, as well as in other activities, such as hunting."

The labyrinth was also introduced as a task at which the performance of either men or women was said to be superior. For Ss for whom the pursuit rotor had been introduced as a task at which women were more proficient than men, the labyrinth was introduced as a task at which men were more proficient than women. If the pursuit rotor had been introduced as a task at which men were more successful, the labyrinth was introduced as a task at which women were more successful. The wording of the two rationales was identical to that used to describe the pursuit rotor.

Social Comparison Feedback

The E gave S the impression that his/her performance was unusually good or unusually poor, relative to that of other Ss who had been in for the experiment, in two of the three social comparison conditions. In the third, E gave S the same test or check trials but did not comment on S's performance.

Success. On the pursuit rotor, after S completed the questionnaire items after the first five trials and took the sixth trial for which E set the speed at 45 rpm, E read the score aloud, recorded it, and then said, "Wow! That's the best score I've seen anyone get after this little bit of practice." On the labyrinth while S was filling out the questionnaire after his/her first three minutes of practice, E pretended to look over S's scores.

When S returned the questionnaire, E said, "Your highest score was (whatever score S had reached on his or her best trial). That's the furthest I've seen anyone get after this little bit of practice."

Failure. On the pursuit rotor, E said after the test trial, "You're really not doing very well. Almost everyone else can keep on target longer that that after this much practice." On the labyrinth, when S returned the questionnaire E said, "You're really not doing very well on this one. Almost everyone else got past (whatever score S had reached on his or her best trial) after this much practice."

No Social Comparison. On the pursuit rotor Ss took the sixth trial at the specified speed, 45 rpm, but E did not comment on Ss' performance. On the labyrinth, Ss were asked to stop practicing after the first three minutes and to fill out the questionnaire, but no comment was made on their performance before they were allowed to resume practice.

Experimental Design

Social comparison feedback was scheduled in such a way that all Ss who were told that their performance was best (success) on the first task, the pursuit rotor, were told that their performance was poor (failure) on the second, the labyrinth. Those who experienced failure on the pursuit rotor experienced success on the labyrinth. This was done both in order to attenuate the impact of failure and to increase the believability of the experimental conditions. Ss who received no feedback on the pursuit rotor also received none on the labyrinth.

Each S experienced one task as a task at which members of his/her own sex usually did best, and one at which members of the opposite sex usually did best.

Measures of dependent variables (to be described) were obtained before

as well as after the success or failure treatments for each of the two tasks. The experimental design is depicted in Table 1. Within each sex, Ss were assigned to conditions in rotating order. An effort was made to obtain an equal number of male and female Ss.

Dependent Variables

Four kinds of measures were obtained in the course of the experiment:

(1) Behavioral measures of:

a. Goal setting
b. Practice effort
c. Performance

(2) Subjective, self-report measures of:

a. Enjoyment
b. Effort
c. Proficiency
d. Goals held during practice

(3) S's attributions of performance on each of the tasks--that is, his/her judgments of how much performance depended on each of five performance determinants:

a. Sex
b. Ability
c. Effort
d. Task difficulty
e. Luck

(4) Self-descriptive personality data on masculinity-femininity.

The measures obtained were as follows:

(1) Behavioral Measures

a. Goal Setting. The rpm Ss chose for their practice efforts on the pursuit rotor were taken as indicators of the degree of challenge Ss were willing to set for themselves, with the 60 rpm speed assumed to be obviously the most difficult task, and the 15 rpm speed the least difficult. There was no comparable measure on the labyrinth.

b. Practice Effort. The measure of effort on the pursuit

Table 1

Experimental Design Treatment Sequences and Labels of Experimental Conditions

Pursuit Rotor		Labyrinth		
Sex Labeling Treatment	Social Comparison Treatment	Sex Labeling Treatment	Social Comparison Treatment	Condition Designation
Masculine	Success	Feminine	Failure	Masculine-Feminine:Success-Failure
Masculine	Failure	Feminine	Success	Masculine-Feminine:Failure-Success
Masculine	No Comment	Feminine	No Comment	Masculine-Feminine: No Comment
Feminine	Success	Masculine	Failure	Feminine-Masculine: Success-Failure
Feminine	Failure	Masculine	Success	Feminine-Masculine: Failure-Success
Feminine	No Comment	Masculine	No Comment	Feminine-Masculine: No Comment

rotor was the number of trials S chose to practice before requesting the test trial. On the labyrinth, E recorded the time, in seconds, from Ss' resumption of practice after receiving social comparison feedback, to their decision to stop for the final "test".

c. Performance. Three performance measures were obtained from the pursuit rotor data. The first, pre-social comparison measure was the number of seconds (out of 20) that Ss remained on target during the sixth trial at the 45 rpm speed set by E. After social comparison, when Ss said they were ready for the final tests, the same measure was obtained from the 45 rpm and the 60 rpm final trials.

Several performance measures were obtained from the labyrinth data. The first, S's Best Scores were the highest scores attained by S in either the initial 3 minute practice period or the post-feedback practice period. Sums, either over the last five trials within the first three minutes or over the postfeedback practice period, were also recorded for each S. Each S also received a Test Trial Score for the trial taken to measure his/her final performance "for the record".

(2) Subjective Reports

a. Enjoyment. Ss responded to the questionnaire item describing their enjoyment of each task twice: after completion of the initial practice period but before social comparison success or failure feedback and again after the final test trial. Ss were asked to place a check mark along a line to describe how much they were enjoying the task, with the lower end labeled "not at all" and the upper, "very much". Responses were scored according to the distance of Ss' check marks from the lower end of the scale.

b. Effort. At the conclusion of each of the two tasks, Ss indicated how much effort they had put into the task, from "very little" to "very much", with the response scored in the same way.

c. Proficiency. Ss gave subjective evaluations of their learning progress or performance on each task twice: after completion of the initial practice period but before social comparison success or failure feedback and at the end of each task. Ss described how well they believed they were doing (or had done) along a continuum described as "poor" at its lower end to "excellent" at the top.

d. Self-Expressed Goals. At the end of each of the tasks, E asked, "Did you have a goal while you were practicing on the task?" If the answer was yes, E asked S to describe it. E also asked S how he/she decided when to take the test trial, whether or not he/she felt he/she had made progress in learning the task, and to describe any turning points in learning progress he/she could remember.

(3) Attributions of Performance. Attributions were described through the use of a device similar to a pie diagram which allowed Ss to ascribe performance on each task to any of five possible determinants: sex, ability, effort, luck, or task difficulty. The device was made of five circular cardboard discs, of different colors, each disc slit to its center and slipped on its axis through each of the others so that the amount of each colar showing could be adjusted by S. Each color was labeled with one of the

five attributes, and Ss adjusted the series of discs to display their best judgment of the amount that performance on the task depended on each of the five qualities. Ss could obliterate any of the five qualities if they so chose, or they could state that one of the qualities named completely accounted for performance effectiveness.

The score for each attribution was the number of degrees, out of the 360 available in the complete set of discs, that S assigned to each of the five possibilities. Four of the five--natural ability, effort, luck, and task difficulty--are the standard attributions measured in most investigations concerned with attribution theory. The fifth, sex, was added because of its special interest to the present study, and because other investigators have reported that many individuals will add attributes other than those given in most experiments if they have the opportunity (Frieze, 1975; Falbo, Beck and Melton, 1976). Ss made these judgments twice for each task: after initial practice but before social comparison success or failure, and at the end of each task.

(4) Measure of Masculinity-Femininity. We used Bem's Sex-Role Inventory, or the BSRI, and scored it according to the procedure described by Bem and Watson (1976). After the recommendation of Spence, Helmreich, and Stapp (1975), the procedure establishes a fourfold classification of Ss as either masculine (high masculine-low feminine), feminine (high feminine-low masculine), androgynous (high masculine-high feminine), or undifferentiated (low masculine low feminine).

RESULTS

Goal Setting

The average rpm chosen by Ss during their first five practice trials on the pursuit rotor was the behavioral measure of level of aspiration, or the degree of challenge preferred by Ss in their chosen tasks. There were no statistically significant differences by sex or by sex-labeling of the task before social comparison success or failure, although there was a slight trend in the direction of males choosing higher speeds of rotation than females (F (1, 81) = 2.31; $p < .20$).

Social comparison success and failure, however, produced a highly significant effect. Ss who failed their first test confined their subsequent practice to the selected test trial speed, 45 rpm. Ss who succeeded at the first test trial did not differ in their subsequent practice at 45 rpm from Ss to whom no comment was made. However, those who were successful in their first five trials chose the 60 rpm setting more often than the Ss to whom no comment was made, who in turn, chose to practice at 60 rpm more often than the Ss who had experienced failure. Average proportions of practice trials at 45 and at 60 rpm are shown in Table 2. The F tests for proportions of trials at 45 rpm and for proportions of trials at 60 rpm, are highly significant as a function of social comparison feedback: (F (2, 73) = 10.02; $p < .001$) for proportion of trials at 45; (F (2, 73) = 7.63; $p < .001$) for proportion of trials at 60. There are no other significant effects. Thus, the effect of feedback conveying information about quality of performance relative to that of other individuals was the same for both sexes. Failure focused subsequent attention on mastering the task under the conditions at which performance had been said to be poor. Success shifted attention to a more difficult task. Either positive or negative

Table 2

Proportions of Practice Trials Selected at 45 and at 60 rpms after Social Comparison Success, Failure, or No Comment on Early Test Trial

Social Comparison Treatment	Average Proportion at 45 rpms	Average Proportion at 60 rpms	N
Success	.32	.49	29
Failure	.59	.20	28
No Comment	.34	.38	28

feedback produced a departure from usual behavior under the "no comment" condition, and did so equally for men and women.

Practice

Both the pursuit rotor and the labyrinth gave objective measures of the effort Ss would devote to perfecting their performance. The measure of practice effort based on the pursuit rotor data was the number of periods of rotation S chose to practice before asking for his/her test trials. For the labyrinth, the measure was based on the length of time S practiced before requesting the final trial "for the record". Square roots of time (in seconds) were used to reduce skewness for the labyrinth measure.

There were no significant differences as a function of sex-labeling of tasks or social comparison treatment on either of the tasks. However, women tended to practice longer than men before asking for their test trial on both. Average amounts of practice for males and females are given in Table 3. While the F for the sex difference is not quite significant for the pursuit rotor data ($F(1, 73) = 3.59$; $p < .10$) the same sex difference appears for the labyrinth data, with women again taking longer to practice than men ($F(1, 71) = 3.15$; $p = .081$).[1] One other difference also approached significance for the labyrinth, an interaction between sex of S and the sex-labeling of the task, with both men and women practicing longer when the labyrinth was described as a task at which members of their sex did well. ($F(1, 71) = 3.05$; $p = .086$).

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[1] Two Ss who reported having practiced extensively on the labyrinth at home, and whose scores clearly reflected extensive previous practice, were eliminated from all data analyses on the labyrinth task.

Table 3

Average Amounts of Voluntary Practice on Pursuit Rotor and Labyrinth by Men and by Women

Task	Measure	Men	N	Women	N
Pursuit Rotor	Average Number of Trials	5.4	43	7.0	42
Labyrinth	Average Seconds of Effort (square root)	15.1	41	17.3	42

Performance

Both the pursuit rotor and the labyrinth gave objective measures of performance effectiveness which were obtained both before social comparison success or failure and after Ss had been permitted to practice, as they wished, until they were satisified with their performance.

Pursuit Rotor Performance. There was a sizeable sex difference in performance on Trial 6, the trial for which Ss were required to perform at 45 rpm. Men averaged 8.41 seconds on target; women 5.96 and the difference is significant at the .001 level (F (1, 81) = 19.87; $< .001$). By the end of the self-regulated practice period, the sex difference in favor of men, while still statistically significant, was reduced; (F (1, 73) = 7.85; p = .007). Men's average number of seconds on target increased to 10.12 and women's to 8.08. Women compensated partially for their initial disadvantage by longer practice. Neither social comparison, nor describing the task as one on which men or women excelled, produced statistically significant effects.

In view of the sex difference, an analysis of covariance, using Ss pre-feedback levels of performance as a covariate, was performed to test the significance of differences in performance increments between men and women after social comparison treatment and subsequent practice efforts. All differences, including sex differences, differences according to sex-labeling treatment, and differences according to social comparison were statistically non-significant in this analysis as well.

Performance on Labyrinth. In contrast to results dealing with the pursuit rotor, all performance measures on the labyrinth after social comparison feedback showed significant differences between sex-labeling and social comparison treatments. As with the pursuit rotor, men performed significant-

ly better than women during the first three minutes of practice. This was true using either S's best score obtained during the first three minutes of practice, or the sum of S's last five trials in the initial practice period as the measure of performance (Best score: F (1, 79) = 5.80; p = .019; Sum of last five trials: F (1, 79) = 7.56; p = .008).

Following social comparison feedback, a significant interaction between sex, sex-labeling of the task, and social comparison appeared. Both men and women performed comparatively poorly after failure, especially if the task was sex-appropriate, better after success, but contrary to our expectations both men and women performed best when the task was sex-appropriate and no social comparison feedback was given.[2] Men's performance was outstanding when no comments were made evaluating their skill relative to that of other men, but they believed that men in general were good at their task. Women also performed best when they thought the task was performed best by women, although their performance was less outstanding. Again, the results appeared parallel whether S's best score or the sum of S's scores over the last five trials during practice was used as the measure of performance (F sex x sex-labeling x social comparison for S's Best score = F (2, 71) = 3.80; p = .028; for sum of last five trials = 2.65; p = .078). However, when the sum of Ss' scores over the last five trials was used as the measure, the sex difference

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[2] The sex-labeling treatment, which was apparently an effective one could produce either a similar effect for both men and women or an effect which depended on S's sex. The former appear in data analyses as main effects of the sex-labeling treatment, and the latter as interactions involving sex and sex-labeling. We have referred to the former in the text as effects of sex-labeling. Results in which the effects for men receiving the masculine sex-labeling treatment parallel those for women receiving the feminine sex-labeling treatment are referred to as effects of sex-appropriateness.

approached significance as in the pre-feedback data, with men performing better than women (F (1, 71) = 3.97; p = .051), and the interaction between sex and sex-labeling of task was significant at the 5% level (F (1, 71) = 5.03; p = .029) with both men and women performing better when the task was sex-appropriate. The results appear in Table 4.

An analysis of covariance, using Ss' pre-feedback performance level as the covariate, was performed on sums of scores over the last five practice trials. Ss' performance during the postfeedback practice period, by this analysis also gave rise to a triple order interaction which was significant at the 5% level (F (2, 70) = 3.62; p = .032), with both men and women improving most without social comparison feedback of any kind when the task was sex-appropriate for them, and least after failure, especially when the task was sex-appropriate.

Additional analyses were performed on Ss' scores on the final test trial, the trial taken after Ss expressed readiness to discontinue practice and take the final trial "for the record". In contrast to the previous analyses of data relating to the practice period, test trial scores showed a large and significant main effect for sex (F (1, 71) = 16.0; $p < .001$). The triple order interaction between sex of S, sex-labeling of task, and social comparison was also significant at the 5% level, again with both men and women doing their best when they had received no comment on their performance (F (2, 71) = 3.26; p = .045). To determine the relationship between Ss' levels of performance during their practice and their performance on the final test trial, an analysis was conducted using Ss' test trial scores and subtracting from them the average of Ss' last five trials before taking the test, during the practice period. The analysis showed a significant sex difference, with men, on the average, showing improvement on the test trial relative to their

Table 4

Average Performance of Men and Women on Labyrinth

According to Social Comparison and Sex-Labeling Treatments

Sex-Labeling Treatment		Masculine			Feminine		
Social Comparison Treatment		Success	Failure	No Comment	Success	Failure	No Comment
Measure	Sex of Subject						
Best Scores during Practice							
	Men	11.4	8.3	16.4	10.0	11.0	11.6
	Women	11.1	10.7	7.9	10.9	8.3	11.3
Average Score for Last Five Practice Trials							
	Men	5.8	4.7	8.1	4.2	4.7	4.7
	Women	4.1	5.0	3.7	5.0	4.3	4.7

own performance during practice, while the performance of women deteriorated (F (1, 71) = 8.71; p = .005). These results are shown in Table 5. In fact, men performed more poorly on the average during the test trial than they had been performing in practice in only one experimental condition: when they had experienced social comparison failure and the task was sex-appropriate. Women performed more poorly in the test trial than during practice in all conditions but one: when they received no feedback and the task was sex-appropriate. Thus, two separate effects were observed. The first was a differential effect according to sex-appropriateness of the task in which both men and women profited most from practice when they thought the task was one on which members of their sex did well, especially when they were given no other basis for evaluating the excellence of their performance relative to that of other men or women. The second was a sex-differentiated response to the stress of performing "for the record", a stress which apparently gave rise to unusual care and excellence for men but was disruptive to the performance of women.

Enjoyment, Effort, and Subjective Performance Evaluations

All Ss were asked to describe their reactions to the two tasks first, as they completed the initial practice periods on both the pursuit rotor and the labyrinth and second, after the tasks were finished and all test trials recorded.

Enjoyment. Ratings of task enjoyment were analyzed first for sex differences and differences according to sex-labeling of the tasks before social comparison feedback was introduced. Results of a repeated measures ANOVA showed two significant interactions: an interaction between the order of sex-labeling treatment and the task being rated such that whichever task was described as a task which men did well was seen as the more enjoyable

Table 5

Average Test Trial Scores and Average Differences between Practice and Test Trial Scores of Men and Women

Sex Labeling Treatment		Masculine			Feminine		
Social Comparison Treatment		Success	Failure	No Comment	Success	Failure	No Comment
Measure	Sex of Subject						
Average Test Trial Score							
	Men	7.6	3.7	11.3	5.6	6.8	6.4
	Women	3.9	3.0	2.7	4.7	3.6	5.0
Average Difference between Test Trial and Average Scores on Last Five Practice Trials							
	Men	1.8	-1.0	3.1	1.4	2.1	1.7
	Women	- .2	-2.0	-1.0	- .3	- .7	.3

(F (1, 79) = 4.26; p = .035). The triple order interaction between sex, order of sex-labeling treatment, and task was also significant (F (1, 79) = 5.01; p = .029). Average enjoyment ratings for men and women are shown in Table 6. The averages obtained indicate that the triple order interaction was primarily due to the ratings reported by women. The men liked the labyrinth somewhat better than the pursuit rotor whatever the sex-labeling treatment, but the women reversed their task preferences according to sex-labeling, preferring whichever task was described as one men did well.

Table 6

Ratings of Task Enjoyment by Men and Women According to Sex-Labeling of Task

Order of Sex-Labeling Treatment	Pursuit Rotor		Labyrinth	
	Men	Women	Men	Women
Pursuit Rotor: Masculine Labyrinth: Feminine	51.3	60.2	55.8	53.4
Pursuit Rotor: Feminine Labyrinth: Masculine	57.8	44.3	61.9	60.0

The addition of social comparison feedback also produced several near significant interactions which were consistent in nature over both tasks. For the pursuit rotor, social comparison success, failure, or no comment produced much greater differentials in the enjoyability of the task when it was thought to be feminine than when it was masculine. Failure when the pursuit rotor was described as a task women did well rendered the pursuit rotor quite unenjoyable, but success made for high enjoyability. The interaction between sex-appropriateness of the task and social comparison barely missed

being significant at the 5% level (F (2, 73) = 3.12; p = .051). The interaction between sex and sex-labeling also approached significance, with women being more affected by sex-labeling than men, or in other words, showing the greater differences in reaction according to the sex-appropriateness of the task. Their reaction was such that their enjoyment of the task was not impaired by failure, provided that the pursuit rotor had been described as a task performed well by men. However, when it had been described as a task done well by women, their lack of enjoyment was striking. Men did not react so differently after either success or failure (F (1, 73) = 3.14; p = .081).

A similar effect occurred on the labyrinth, with triple order interactions between sex, sex-labeling, and social comparison conditions approaching significance at the 5% level by analysis of variance of final ratings of task enjoyment and by analysis of covariance using pre-feedback ratings of enjoyment as the covariate, (F (2, 71) = 3.08; p = .053; F (2, 70) = 3.030; p = .055, respectively). Average enjoyment ratings of both tasks appear in Table 7. On both tasks, enjoyment was more a function of social comparison when the sex-labeling of the task was feminine, with failure making the task seem quite unpleasant and success making for increased pleasure. When the task labeling was masculine, success and failure seemed to make less difference. On the pursuit rotor, the effect was more pronounced for women, who appear to have been particularly responsive to social comparison failure, while on the labyrinth, the effect appeared more strongly for men, who appear to have been particularly responsive to success.

Effort. Effort ratings were obtained only at the termination of practice on both tasks. Averages for experimental conditions are reported in Table 8. For the pursuit rotor data, both the main effect for comparison and the

Table 7

Ratings of Task Enjoyment by Men and Women after Social Comparison Treatment and Practice according to Experimental Condition

Order of Sex-Labeling Treatment	Order of Social Comparison	Pursuit Rotor		Labyrinth	
		Men	Women	Men	Women
Pursuit Rotor: Masculine Labyrinth: Feminine	Success: Failure	48.9	57.1	48.4	58.7
	Failure: Success	54.0	64.1	76.8	51.7
	No Comment	56.3	56.9	54.1	66.7
Pursuit Rotor: Feminine Labyrinth: Masculine	Success: Failure	60.1	61.9	64.4	66.6
	Failure: Success	53.0	32.6	56.4	67.6
	No Comment	57.0	52.3	69.1	65.0

Table 8

Self-Ratings of Effort after Social Comparison Treatment and Practice according to Experimental Condition

Order of Sex-Labeling Treatment	Order of Social Comparison	Pursuit Rotor	Labyrinth
Pursuit Rotor: Masculine Labyrinth: Feminine	Success: Failure	66.9	64.4
	Failure: Success	61.7	62.6
	No Comment	52.9	62.6
Pursuit Rotor: Feminine Labyrinth: Masculine	Success: Failure	69.5	72.5
	Failure: Success	48.8	61.6
	No Comment	67.8	76.9

interaction between sex-labeling and social comparison produced differences significant at the 5% level (Social Comparison: F (2, 73) = 3.31; p = .043; Sex-Labeling x Social Comparison: F (2, 73) = 3.80; p = .027). The differences were such that the highest ratings of effort were produced under success, the lowest under failure, and the interaction between social comparison and labeling of sex-appropriateness was such that extremely low ratings of effort occurred when the rotor was described as a task on which women did well but the S him (her) self was doing poorly.

Subjective Performance Evaluations. Men described themselves as making better progress in learning on both the pursuit rotor and the labyrinth than did women before social comparison standards were introduced (F (1, 79) = 5.21; p = .026). In addition, both men and women described themselves as doing less well on the labyrinth than on the pursuit rotor (F (1, 79) = 38.90; $p < .001$). (See Table 9)

Table 9

Men's and Women's Self-Ratings of Learning Progress on Pursuit Rotor and Labyrinth

	Pursuit Rotor	Labyrinth
Men	37.8	23.6
Women	31.4	15.9

Social comparison introduced further differences, with negative feedback producing markedly lower self-evaluations (F (2, 73) = 4.76; p = .012 and F (2, 71) = 7.87; $p < .001$ for main effects of social comparison treatment on the pursuit rotor and labyrinth data respectively). The interaction between sex and social comparison treatment was also significant on the pursuit rotor, with failure clearly being more strongly reacted to by women than by men

(F (2, 73) = 3.49; p = .036). For the labyrinth data, the main effect for sex also approached significance at the end of the task (F (1, 71) = 3.65; p = .061). The triple order interaction between sex, sex-labeling, and social comparison also approached significance (F (2, 71) = 2.69; p = .076). The nature of the effect was such that women described themselves as doing extremely poorly after social comparison failure, but not that much better after success--in fact, less well than if they were given no feedback whatever, and especially if they had been told that the labyrinth was a task women did well. Men described themselves as doing well after social comparison success if the task labeling was feminine but also described themselves as doing well if the task was described as a masculine one without social comparison feedback. This was the condition in which performance records, in fact, demonstrated the best learning men. Average self-ratings at the conclusion of each of the two tasks appear in Table 10.

Table 10

Men's and Women's Self-Ratings of Proficiency after Social Comparison Treatment and Practice According to Experimental Condition

Order of Sex-Labeling Treatment	Order of Social Comparison	Pursuit Rotor		Labyrinth	
		Men	Women	Men	Women
Pursuit Rotor: Masculine Labyrinth: Feminine	Success: Failure	43.9	40.6	21.1	11.0
	Failure: Success	48.1	24.9	48.0	28.3
	No Comment	33.1	49.3	20.3	35.3
Pursuit Rotor: Feminine Labyrinth: Masculine	Success: Failure	50.6	52.6	16.6	12.6
	Failure: Success	37.7	22.0	35.9	25.1
	No Comment	52.7	47.4	45.0	26.0

Overall, the data on the two tasks were consistent, with sex differences in which men tend to rate their progress better than women ap-

pearing on both of the tasks. Social comparison effects were also consistent on the two tasks, with failure evoking a much stronger reaction than success, especially on the part of women. In fact, the men did not always describe themselves as doing less well after failure than they did when no comment was made on their performance, while the women reacted by consistently giving themselves low ratings after failure but also tending to give themselves low ratings even after success. With one small exception, women's best self-ratings appeared when no comment on their performance had been made.

In an effort to determine whether the comparative lack of reaction of the women to positive feedback or success on the labyrinth might not be a carryover from their previous failure experience on the pursuit rotor, self-ratings of progress on the labyrinth before feedback were analyzed by social comparison condition. The results of the analysis indicated that there was a strong pre-existing trend, confined to women, for individuals who had received negative feedback on the pursuit rotor to give themselves low ratings on the labyrinth before social comparison treatment. Average self-ratings by men and women before social comparison feedback on the labyrinth were as shown in Table 11. The F for the interaction between sex and social comparison treatment was 2.018 ($p = .141$). While non-significant, the trend and its appearance in the treatment conditions which had just shown the strongest reaction to the previous failure feedback makes the interpretation of the women's reaction to the success treatment on the labyrinth equivocal in this data set. Women's seemingly dampened reaction to success may have been due to carryover effects from the preceding part of the experiment.

Table 11

Men's and Women's Self-Ratings of Learning Progress on Labyrinth before Social Comparison Treatment

Order of Social Comparison	Men	Women
Success: Failure	20.0	20.0
Failure: Success	29.3	8.6
No Comment	23.1	19.6

Attributions of Performance and of Success and Failure

Ss were asked for their performance attributions, or for their best judgments as to determinants of performance four times--once on each task before E commented on the excellence or the poorness of their scores and once as the task was terminated. Five attributions were possible: sex, task difficulty, natural ability, effort, and luck. Table 12 shows the average attributions to each of the five possibilities made by Ss of each sex before receiving social comparison feedback, according to sex-labeling treatment.

It had been hoped that the two tasks would show similar patterns of attribution before social comparison feedback. However, a repeated measures analysis of variance showed that two of the five possible attributions differed according to the task being described. Pursuit rotor performance was seen as more a reflection of natural ability than was performance on the labyrinth (F (1, 79) = 3.56; p = .063). Performance on the labyrinth was also seen as much more a function of luck than performance on the pursuit rotor (F (1, 79) = 30.85; $p < .001$). In view of the larger of the two differences, the attribution of performance on the labyrinth to luck, the application of the sex-labeling treatment to the two tasks could not be

Table 12

Average Attributions of Performance on Pursuit Rotor and Labyrinth by Men and Women

Attribution	Order of Sex-Labeling Treatment	Average Rating for Pursuit Rotor		Average Rating for Labyrinth	
		Men	Women	Men	Women
Sex	Pursuit Rotor: Masculine Labyrinth: Feminine	35.2	18.6	40.3	23.6
	Pursuit Rotor: Feminine Labyrinth: Masculine	48.3	41.2	33.8	33.6
Task Difficulty	Pursuit Rotor: Masculine Labyrinth: Feminine	78.6	97.1	81.0	94.3
	Pursuit Rotor: Feminine Labyrinth: Masculine	104.3	88.3	90.5	107.4
Natural Ability	Pursuit Rotor: Masculine Labyrinth: Feminine	111.8	99.8	103.5	91.9
	Pursuit Rotor: Feminine Labyrinth: Masculine	92.9	102.4	86.9	86.9
Effort	Pursuit Rotor: Masculine Labyrinth: Feminine	103.0	117.1	80.8	103.8
	Pursuit Rotor: Feminine Labyrinth: Masculine	70.7	85.2	76.4	80.5
Luck	Pursuit Rotor: Masculine Labyrinth: Feminine	30.5	26.0	53.3	46.9
	Pursuit Rotor: Feminine Labyrinth: Masculine	43.4	41.9	71.9	51.2

regarded as equivalent to each other, and attribution data for the two tasks were analyzed separately.

Analyses of attribution data before social comparison feedback for the pursuit rotor showed that: (1) Men tended to credit more performance to sex than women (F (1, 81) = 3.93; p = .051); (2) More performance was credited to sex when the pursuit rotor was described as a task which was performed well by women (F (1, 81) = 8.85; p = .004); (3) Both men and women attributed more performance to task difficulty when the task was described as one usually performed better by members of the opposite sex (F Sex x sex-labeling = F (1, 81) = 4.45; p = .038); (4) More performance was credited to effort when the pursuit rotor was described as a task performed well by men (F (1, 81) = 11.69; p = .001); and (5) More performance was credited to luck when the pursuit rotor was described as a task done well by women (F (1, 81) = 5.15; p = .026). In sum, performance was seen to be more a function of effort when men's performance was thought to be usually superior to that of women. When women's performance was thought to be usually superior, both sex and luck were thought to play a greater role, and members of both sexes attributed more performance to task difficulty when they were performing a task which they believed likely to be better performed by members of the opposite sex.

Analysis of covariance was used to test the significance of differences resulting from the addition of E's social comparison feedback. Two interactions between Ss' sex and reactions to success and failure proved to be statistically significant in this analysis. Men's attributions of performance to natural ability were either constant or somewhat increased after success or when no comment was made on their performance, but were lowered after failure. Women's attributions to natural ability, in contrast, were lowered after either success or with no comment but were increased after failure

(F sex x social comparison = F (2, 72) = 3.29; p = .043).

Attributions to effort shifted in an opposite manner for both sexes. Men lowered their attributions to effort if they experienced success, but increased them if they experienced failure or if they received no feedback. Women again did the converse; their attributions of performance to effort were increased after success, reduced after failure, and were relatively similar to those of men only when they received no feedback, when they, like the men, increased their attributions of performance to effort with longer experience (F sex x social comparison = F (2, 72) = 3.14; p = .049). Average attributions of performance to natural ability and to effort by men and by women according to social comparison treatment are shown in Table 13.

Table 13

Changes in Attributions of Pursuit Rotor Performance to Natural Ability and Effort by Men and Women after Succeeding, Failing, or Receiving No Comment on Their Own Performance

Social Comparison Treatment	Average Change In Attribution			
	Natural Ability		Effort	
	Men	Women	Men	Women
Success	.0	-18.6	-13.0	10.7
Failure	-14.6	8.2	8.2	-13.2
No Comment	15.6	- 5.0	10.1	15.7

Lastly, a main effect for sex-labeling treatment was obtained for attributions to luck. When the pursuit rotor was described as a task that men did well, attributions to luck were increased in the final measurement, whether the social comparison treatment had been success, failure, or no

comment (F (1, 72) = 6.44; p = .013). When the rotor was described as a task women did well, attributions to luck were decreased, again whether the social comparison treatment was success, failure, or no comment. The effect of the differential shift was such that when they first began to practice on the task, both men and women saw performance on the pursuit rotor as more a function of luck when it was described that women did it well. However, by the end of their task experience, sex-labeling no longer made a difference in perceptions of the importance of luck (F (1, 73) = .012; $p > .50$). However, there was a difference according to sex-labeling treatment in the process through which this relatively egalitarian perception was accomplished. Whereas the masculine performance was seen as more due to luck as time went on, the feminine performance was seen as more due to luck at the outset, but less so after increased practice.

Parallel analyses were carried out on data based on learning the labyrinth. Only one statistically significant difference emerged on all analyses: a main effect of sex-labeling such that when the labyrinth was described as a task which men ordinarily performed better than women, attributions to effort were lower as the task was concluded than they had been in the first, pre-feedback series of judgments (F (1, 70) = 5.61; p = .021). If the labyrinth was described as a task performed best by women, attributions to effort were increased with longer experience on the task. While on first thought, this result might appear to be inconsistent with other data--as, for example, with the fact that sex-labeling for the pursuit rotor produced a difference such that performance was seen as more strongly reflecting effort when the task was described as one which men did well--further reflection points to the apparent difference between the pursuit rotor and the labyrinth and to the subtlety of the attribution process. The difference on the pursuit

rotor occurred after extremely limited experience with the task and before much could be learned as to the likelihood of learning progress; it would indicate that male performance is considered to be contingent on effort on a priori grounds. The nature of the labyrinth is such that almost all Ss make some progress in successive trials. Ss can hardly fail to notice their own improvement over time if they continue to practice. Hence the increased attribution to effort in the final judgment might be taken to reflect a conviction that if performance on a feminine task improves, it is due to the effort expended. If so, the result is consistent with results obtained by others which indicate that effective performance by women is seen as a reflection of effort (Falbo, et al, 1976) and is the obverse of result from the pursuit rotor data that performance on feminine tasks is credited less to "luck" as time goes and performance improves.

The lack of significant differences in attributions from the data for the labyrinth is taken as an outgrowth of our failure to take into account the caution cited by Winer (1962, 1971, pp 517-518) in connection with order or sequence effects. Our Ss experienced the sex-labeling treatment on the labyrinth task immediately after having experienced a task described in an opposite fashion, and were asked to describe their attributions on a device which elicited results which were correlated in successive measurements. As Winer notes, there is a strong possibility that practice, fatigue, transfer of training, or the like will become entangled with treatment effects in designs like ours. We are inclined to place more credence in the attributional data for the pursuit rotor than in the data from the labyrinth, which must be regarded as subject to the cautions Winer raises.

Masculinity, Femininity and Androgyny

Bem's Sex-Role Inventory, or the BSRI was the measure of masculinity

and femininity used in the present study. The scoring method described by Bem and Watson (1976) was used to yield a four-fold classification of Ss high in both maxculinity and femininity (considered androgynous), high in masculinity but low in femininity (considered masculine), high in femininity but low in masculinity (considered feminine), or low in both (considered undifferentiated). The recommended scoring procedure involves scoring the dimensions of masculinity and femininity, classifying Ss as above or below the median within the sample tested on each of the two dimensions, and establishing the four-fold classification. As applied to the particular sample of volunteers recruited for the present experiment, however, the scoring method yielded suprising results in relation to Ss' race. It will be remembered that black volunteers were unevenly divided as to sex, with more black women represented among the volunteers than black men. The racial composition of the four-fold classification was obviously uneven. Numbers of black and white men and women classified as Androgynous, Masculine, Feminine, and Undifferentiated are show in Table 14. It is clear that the black women differed from the white women in the likelihood of being classified as Feminine and Masculine: while the majority of the black women were either Androgynous or Masculine, none of the white women were classified as Masculine and over 40% were Feminine. The majority of the members of the Undifferentiated quadrant were white men.

To explore further the nature of the difference between the black and the white Ss, analyses of variance of mean differences between black and white men and women were computed separately for the two dimensions Masculinity and Femininity. These averages are shown in Table 15. The difference between blacks and whites on the dimension of Masculinity is significant at the 5% level, with both black women and black men scoring higher on the

Table 14

Classification of Ss on Bem Sex-Role Inventory According to Race and Sex

Sex Role Inventory Classification	Blacks		Whites	
	Men	Women	Men	Women
Androgynous (High Masculine-High Feminine)	2	8	4	10
Masculine (High Masculine-Low Feminine)	2	5	14	
Feminine (Low Masculine-High Feminine)	1	4	5	10
Undifferentiated (Low Masculine Low Feminine)		2	15	3
N	5	19	38	23

Table 15

Average Masculinity and Femininity Scores of Black and White Men and Women

Bem Sex-Role Inventory Scale	Blacks		Whites	
	Men	Women	Men	Women
Masculinity	5.5	5.0	4.9	4.7
Femininity	4.7	5.0	4.5	5.1
N	5	19	38	23

average than white women or white men (F (1, 81) = 4.51; p = .037). Sex differences are not statistically significant (F (1, 81) = 2.96; p = .09). On the dimension of Femininity, sex differences are larger and highly significant with both black and white women clearly describing themselves as more feminine than either black or white men, and the race difference does not approach significance (F sex = F (1, 81) = 12.40; p = .001; F race = F (1, 81) = .05; $p > .50$). The preponderance of black women classified as Androgynous stems from their Masculinity scores which do tend to be higher than those of the white men in this particular sample of undergraduate students, while the relatively low Masculinity scores of the white men leads to their classification as Undifferentiated.

It might be noted that the white men of this sample are not deviant or unusual in their self-descriptions. In fact, the average Masculinity score for white men in this sample, 4.9, is almost exactly the same as the median given by Bem and Watson (1976) for their standardization sample of Stanford undergraduates, 4.89. Presumbly, the Stanford sample was predominantly white. It appears to be the black women who introduced the unusual element in the present sample, and the data would indicate that there is a good possibility that black culture accentuates some traits considered masculine in American society at large in both men and women.

The existence of differences between blacks and whites in their sex-role concepts is confirmed by race differences in attributions to sex. In the course of the experiment, all Ss had four opportunities to use sex as an explanation for performance on each of the tasks they had undertaken to learn, two of them before receiving any feedback on their own personal level of skill as compared with that of other Ss. Ten of the 85 Ss gave sex no credence whatsoever as a determinant of performance; of the ten, seven were

black (including one of the five black men). Average attributions to sex from the two pre-feedback ratings on the two tasks are shown in Table 16. It appears that what had seemed to be a difference between men and women was actually largely a difference based on race in which black men and women shared a tendency to make lower attributions to sex than white men and women (F (1, 79) = 5.196; p = .026). The difference between men and women was both smaller and non-significant (F (1, 79) = .688; p = .410) as compared with the difference based on race. The seemingly higher attributions to sex of the men in the overall sample was actually due to the higher proportion of white men than of white women among our volunteers. The remainder of the attributional data was inspected for similar differences, but only attributions to sex showed such striking race differences.

Table 16

Average Attributions to Sex by Black and White Men and Women

Sex of Subject	Blacks	N	Whites	N
Men	27.5	5	40.6	36
Women	19.3	19	37.4	23

DISCUSSION

Results are discussed under three general sections. In the first, we are interested in the relationship between performance, as it was objectively observed and recorded by our E, and men's and women's subjective evaluations of their own capabilities at our two tasks. In the second, we are interested in men's and women's enjoyment of their learning experience at the tasks and in their attributions of performance, or in their beliefs as to the variables underlying performance effectiveness at the tasks. The third section is concerned with the results on differences between blacks and whites and on relationships between race differences and sex differences.

Performance and Self-Evaluations of Abilities. Results provide little support for the hypothesis that men and women would be differentially susceptible to social comparison information as compared with task feedback. Both men and women gave clear indications of reacting to social comparison success or failure, whenever it was available, judging from goal setting behavior on the pursuit rotor. Both men and women also reacted in the same way to negative comments on their skill in learning the labyrinth, as well as to sex-labeling. Individuals of both sexes showed better learning when no comments on their progress had been offered, and performed more poorly when their progress was criticized, especially when they believed other members of their own sex could perform well.

However parallel the objective performance records of men and women, they clearly interpreted the situation differently and felt differently about their progress. The men showed little evidence of belief in E's critical comments on their rate of learning. By the end of their practice, men who had been told that their pursuit rotor performance was unusually poor were

describing their progress as positively as the men who had been told it was good, especially if they believed men in general were good at their task. Thus, men gave evidence of the "defensive bias" described and reported by Nicholls (1975) in grade school boys insofar as their perceptions of their progress were concerned: negative feedback had no measured effect on men's judgment of how good their performance was even a few minutes later.

Men's attributions of performance to effort and ability after success and failure showed a similar bias. Men saw pursuit rotor performance as more responsive to effort if their performance was criticized; such a view is consistent both with the acceptance of criticism and with reviewing or dismissing criticism in the light of new experience even when the new experience is brief. Men also thought performance reflected more "natural ability" when they were praised. Both perceptions would justify a sanguine evaluation of their own abilities. If performance reflects "natural ability" when it is good, but is a function of effort rather than ability when it is bad, their evaluations of their own performance capability can be supported by only the positive information. The fact that there were sex differences in the pattern of change after success and failure is confirmation of Nicholls (1975); men seem to possess an ability to absorb feedback selectively that women do not share.

Behaviorally, on the other hand, the men did not practice as long as the women, and in actual fact, the women's performance improved more than the men's in the course of the experiment. Both men's and women's cognitions were somewhat out of line with their behavior; while the men's attributions to effort and ability would seem to justify more effort on their part, especially when they were failing, in fact, their effort did not increase. And while the women's beliefs would be consistent with giving up and failing

to practice, in fact they did put out more effort than the men and actually succeeded in reducing the sex differential in performance by the end of the tasks.

Nevertheless, the women continued to believe that their performance was poor if they had been criticized, even after their more extended practice. There was some indication that women who had been told they were poor at the pursuit rotor continued to believe that they were poor, on our second task. Thus, the women's reaction to criticism was both more severe and longer lasting than that of the men.

The women also showed actual disruption in their ability to perform well on the test trial at the end of their practice on the labyrinth. They failed to do as well when they were being tested as they had just demonstrated they could do when they were only practicing, while the men demonstrated the reverse effect, and in fact, some men did better during the test than they had ever done previously. The direction of the practice test differential is a behavioral confirmation of Nicholl's finding that girls felt worse than boys when they were told they were about to do an important test. Our women were not asked to describe their feelings, but they actually did worse.

However, Nicholls interprets the effect to be a result of sex differences in attributional patterns, with boys being more likely than girls to exert extra effort when they were failing. Our results provide no confirmation for this interpretation. Our results are more consistent with the supposition that there are sex differences in the capacity for mastering the stress associated with the testing situation in this type of task. The women's relatively poor performance on the test as compared with their performance while they were practicing indicates that the process of testing produced an effect which made for their performing worse than usual, and which

underestimated their level of proficiency. The evaluation setting actually enhanced the performance of the men.

The effect, and the conditions under which it was elicited, parallel the conditions cited by Wine (1971) in connection with the arousal of test anxiety. Wine conjectured and reviewed literature in support of the thesis that the attentional focus of high and low test-anxious persons differs in the testing situation; highly anxious individuals divide their attention between the task at hand and distracting, task-irrelevant worries relating to their own somatic symptoms and self-evaluation. Low test-anxious individuals have their interest and motivation aroused in evaluative situations and do their best. While test anxiety is ordinarily construed to be an individual difference variable, the conditions of the present experiment were such as to present, in sequence, a non-evaluative followed by an evaluative performance measurement setting to both men and women. Under these conditions, the men did better when they were performing under evaluative conditions than they did while they were practicing while the women did the reverse.

The differences between experimental conditions during the practice trials on the labyrinth suggest that Wine's interpretation may apply to the process of learning to perform well on the labyrinth as well as to final performance evaluations. Both of our experimental treatments--social comparison success and failure and sex-labeling of tasks--were such as to lead to differential attention to the process of evaluation. Attention to evaluation might be expected to be at its maximum after feedback indicating poor progress, especially if the task is one which other members of one's own sex can do well. On the other hand, in the absence of social comparison feedback, information that most other members of one's own sex do well at the task one is attempting is reassuring. Both men and women, especially the men, demonstrated their

best learning under the most reassuring, least evaluative conditions, and their poorest learning when a negative evaluation had already been offered.

The sex differences in learning rates on the labyrinth are unfortunately uninterpretable in that one cannot say whether or not women might demonstrate as outstanding progress in learning as the men in the no comment, sex-appropriate condition on a task which was easier for them. The sex differences in favor of the men on both of our tasks indicate that the tasks were actually easier for the men than for the women. Other investigations have probably reported more correlations between test anxiety and performance measures for males than for females (Sarason, Davidson, Lighthall, Waite, and Ruebush, 1960; Cotler and Palmer, 1971). However, the present study differs from most other studies in two ways. Anxiety, under the present conditions, would have to be construed as a state rather than a trait measure, and most other studies have not attempted to look at the same person's performance under anxiety aroused and non-aroused conditions. Secondly, the majority of other studies have considered intellectual or scholastic tasks. It might be that motor performance tasks involve skills at which males have a natural advantage and/or previous learning experiences which reverse the situation for intellectual or scholastic tasks, at which females seem to have the advantage of earlier maturation at younger age levels.

Nevertheless, it is noteworthy that men rather than women demonstrated their most outstanding learning under the conditions where social comparison standards for self-evaluation were never introduced. Social comparison theory would predict that failure, phrased in social comparison terms, would elicit the most prolonged practice, especially on sex-appropriate tasks (Festinger, 1954). It had been expected that men, rather than women, would be more responsive to social comparison standards (Kipnis, 1974). Not only did men

fail to practice longer than usual under the conditions of social comparison failure; the men, as well as the women, profited the least from the length of time they did practice.

Conversely, men showed their best learning under conditions which might be thought to involve the greatest resemblance to those eliciting "inner direction" rather than evaluation pressure. The nature of the labyrinth task was such that all who attempted it were automatically involved and attentive to their own progress in learning. On the labyrinth, both men and women, but especially the men, did their best where neither success nor failure had been specified in social comparison terms, and where it was necessary for them to assess their own progress through autonomous standards. Indications were that either success or failure feedback served to distract Ss' attention from task parameters which served them well in learning. What had been anticipated as a control condition, where social comparison standards were never mentioned, in fact proved to be the learning condition under which the best progress in learning took place.

Enjoyment and Attributions

An important key to women's involvement in the learning of tasks like those of our experiment would appear to be sex-labeling, with women, perversely being more attracted to tasks at which men were thought to excel than to tasks better performed by their own sex. Women began both tasks liking them better when they had been described as tasks men did well. Their enthusiam was not even dimmed by social comparison failure, provided that the task had been described as one men were good at. Women's evaluation of their progress in learning indicated acceptance and belief in E's description of how well they were doing, irrespective of sex-labeling treatment. Their enjoyment or their pleasure in the tasks, on the other hand, was a function of sex-labeling

rather than of their own progress or their perception of their own progress.

Furthermore, indications also were that the women's performance was less affected by criticism or failure when the task had been described as one men did well than when it was described as one women did well. When tasks were described as jobs well done by women, both men and women reacted by reporting less enjoyment, if they thought their own performance was poor. The women were especially susceptible to this effect. Women tolerated criticism better and enjoyed both tasks more when the tasks had been described as jobs well done by men.

As for the men, only their actual performance after failure appeared to suffer when tasks were given masculine sex-labeling. Their evaluations of their own learning progress were relatively impervious to failure feedback. Men's performance in general was such that they appeared better defended than the women--better able to perform when being tested, and less willing to conclude that they were slow at learning even after criticism.

The key to the differences between men and women in their enjoyment of the two tasks, as well as their self-evaluations of their progress in learning, seems to lie in the process of attribution. Attributions, like enjoyment, seemingly were a function of sex-labeling, but whereas most of the differences in enjoyment according to sex-labeling were most sharply experienced by women, both men and women saw our tasks differently depending on which sex was thought to be better at performing them. Furthermore, the majority of the differences in perception antedated men's and women's first experiences and reactions to feedback describing their own personal success or failure. They occurred after extremely limited experience with the pursuit rotor, and demonstrated sharp differences according to sex-labeling which seemingly featured biases shared by both sexes. Performance on the pursuit rotor was seen as much

more heavily dependent on effort when the rotor had been described as a task men did well. If it had been described as a task women did well, performance was seen as dependent to a greater extent on sex or luck. Both men and women saw performance on the rotor as more a function of task difficulty when it had been described as a task better done by members of the opposite sex.

The first conclusion would seem to be that men and women share a tendency to view tasks as intrinsically different when the task has been sex-typed. Accordingly, while much interest has centered on sex differences in attributions of success and failure, it may be that more attention should be paid to sex-typing of tasks rather than sex differences in attribution. Furthermore, it might also be the case that personal success or failure is but a small component of what are felt to be the real determinants of performance effectiveness.

The nature of the differences which appeared also do much to explain women's seeming attraction to opposite sex activities. The one attribution, effort, seen to be most demanded for effective performance of the masculine task is cited as the attribution most important for affective response to success or failure (Weiner, 1972). Maximum pride in success is experienced by the actor when he views performance as a reflection of effort. Sex and luck are both thought to be circumstances beyond the control of the actor and undeserving of either reward or punishment. Accordingly, through participation in tasks sex-typed as masculine, women gain the possibility of reward. That they risk failure may seem less damaging to them than failure in tasks sex-typed as feminine; so long as they attempt men's work, less may well be expected of them, by themselves as well as by others. Confining themselves to "women's work" means only that they receive neither credit nor blame.

Masculinity-Femininity and Race

The unanticipated sex difference in race is a factor which confounds interpretation of sex differences in the present sample. From the data obtained, it is ambiguous whether the same sex differences would have been found had the women as well as the men been predominantly white, or had it been possible to obtain data from a larger number of black men as well as black women. Both of our Es were also white women; there is an additional possibility that race differences and/or sex differences were in part a function of examiner or interviewer bias.

However, the differences between men and women in our sample were not of the kind usually associated with supposed lower self assurance or greater defensiveness on the part of blacks. Blacks of both sexes described themselves as more masculine, and therefore, as more assertive, more aggressive, more competitive, and generally, as possessing more of the qualities associated with stereotypic masculinity than did whites of either sex. Spence, Helmreich and Stapp (1975) concluded that self-ratings of sex-related attributes could be accorded the same degree of confidence as other self report measures. If their conclusion is extended to this sample, the result would indicate that the black women were in fact more aggressive, self-assertive, competitive, etc., than were many of the white men.

The result, therefore, might shed much light on the dynamics of situations where blacks and whites of both sexes contact and interact with each other--as for example, in colleges or universities like Temple or within work and military organizations. Spence, et al. (1975) reported that the highest self-esteem on a scale designed to measure self-confidence and competence in interpersonal situations, was had by individuals who were categorized as androgynous on their measure of masculinity-femininity. The

association between self-esteem and masculinity was particularly strong. If both findings and interpretations are generalized to our sample, the most confident, most androgynous individuals to participate in the experiment should be found among the black women.

Bem (1975) demonstrated that androgynous individuals of both sexes tend to show more "feminine" behaviors than nonandrogynous individuals in a situation designed to elicit that type of response, but more "masculine" responses in a situation in which those behaviors were appropriate. In other words, androgynous individuals were capable of both types of responses and behaved appropriately according to the nature of the situation.

Accordingly, our results would suggest that it may be of the greatest importance to first verify or replicate our finding. Secondly, replication and further investigation of Bem's findings as to the situational specificity of appropriately "masculine" or "feminine" behavior is also in order. Should it be found that androgynous individuals do behave appropriately in situations deemed important for organizational functioning, black women might be considered to constitute a population resource whose importance has not been properly appreciated.

Race and Sex, Self-Esteem, and Self-Confidence

The self-assertive and confident self-descriptive data from the BSRI, the denial of the impact of sex on performance from the attribution data, interviewers' impressions, and some explicit comments from interviews all contrast with the performance data from the labyrinth task, in which there were no apparent differences between black women and white women in performance in the test setting; the effect of testing was negative for both. A recent review documents the ambiguity surrounding attempts to specify the similarities and differences between black women and white women, and the

extent to which the achievement behavior of black women can be described as dependent on their sex or on their race (Murray and Mednick, 1977). Murray and Mednick describe much of the data as ambiguous and inconsistent, and there are a great many parodoxes.

Our study is no exception. There are at least three potential explanations of our data. One is that the kinds of data which point to assertive, confident behavior on the part of black women all involve verbal report and self-description, not behavioral data. Murray and Mednick noted that black women have often been depicted as aggressive, independent, and assertive. Our data indicate that they are not only seen by others in this way--they see themselves and present themselves in the same fashion. It is still possible that the assertive stance is only a posture, and that in actual fact, black women as well as white women are equally likely to lack self-confidence, and consequently to perform more poorly than usual under stressful conditions.

A second possibility is that the numbers of black and white women involved in the study were too small to reveal actual differences dependent on race rather than sex. The fact that there were a disproportionate number of black women but not of black men among our volunteers results in a real confounding of sex with race as a variable under study. Given the kind of differences between blacks and whites that appeared, it is possible that our failure to find sex differences in reliance on task feedback, as compared with reliance on social comparison, resulted from the racial composition of our particular sample. The conditions thought to bring about greater reliance on social comparison as a method of self-evaluation are greater reliance on peer groups than on parental figures as socializing influences, more frequent exposure to competitive conditions in which self-evaluation occurs

through comparisons of performance, and less frequent adult contact in which verbal exchange between adult and child is used directly as the means of teaching (Kipnis, 1974). Black women may actually be more similar to men than to white women in these respects, and some of the sex differences we anticipated and did not find may have resulted from the racial composition of our sample of volunteers.

Thirdly, black culture may very well depart in some ways, but by no means all, from the ways of Western society at large. The tendency to describe themselves in a more "masculine" fashion than whites was shared by black men and black women, as was the deemphasis on sex as an explanation of task performance. Both differences point to a greater valuation of the qualities associated with masculinity in black culture than in white, and to a lesser emphasis on sex differences in work performance. However, there is still no guarantee of the actual experiences necessary to obtain mastery over such stresses as that associated with our "testing" situation on the labyrinth task. Here, the white men had an asset that the women of either race did not have; it may be that black men, whom we had very little opportunity to observe, would have had as much difficulty as the women in the test situation, and that the sex differences we did observe resulted from the presence of more blacks among the women than among the men in our sample. Any decision as to which interpretation is most correct must be based on data beyond that provided by our study.

CONCLUSIONS

College men and women demonstrated best learning of a motor skills task in a learning situation in which no evaluative comments, either positive or negative, were made on their learning progress while they were attempting to learn, and they also believed that most other members of their own sex were able to perform the task well. Both men and women performed poorly if their learning progress was criticized, especially if they believed that other members of their own sex were able to perform the task well. However, men's self-appraisals of their progress in learning at the end of the tasks did not show long range conscious acceptance of information criticizing their learning progress. Men decreased the extent to which they believed performance reflected ability if their own rate of learning had been criticized. Women did not show the same bias, and also showed evidence of a more severe and longer lasting reaction to criticism of their learning progress.

Men and women reacted differently to a test situation as compared to practice trials. Men performed better when they believed they were being tested than they did while they were practicing, while women performed more poorly.

Women enjoyed learning tasks which they had been told men usually performed better than women; they enjoyed learning the same tasks less when they were told women were likely to be good at them. Men did not show less pleasure in learning tasks that had been described to them as tasks women did well. Both men and women saw a task described to them as a task men were good at as more responsive to effort for good performance. If the same task was described as one women were good at, it was seen as more dependent on luck. The perception that performance on the "masculine" task was more dependent on effort is in accord with the women's tendency to enjoy learning

and performing tasks more when they believed men were likely to be more proficient. The perception is also in accord with a belief that masculine tasks are intrinsically more challenging.

Both black men and women and white men and women participated in the experiment; however, more black women than black men volunteered as Ss. While the different proportions of blacks among the men and women make for difficulties in interpreting some of the sex differences obtained in the study, race differences in sex-role related personality traits were among the more interesting results. Black men and women described themselves in a more "masculine" fashion on the Bem Sex-Role Inventory than did white men and women. Race differences in sex-role perceptions and behavior should be followed in further research, particularly to test behavioral correlates of sex-role related self-perceptions among black men and women as compared with those of whites.

APPENDIX A

SUBJECTS' SEX AND RACE ACCORDING TO EXPERIMENTAL CONDITION

Condition	Male			Female			N
	White	Black	Other	White	Black	Other	
MSFF	7	1		4	3		15
MFFS	6		1	2	5		14
MNFN	4	2	1	3	4		14
FSMF	5	2		3	4		14
FFMS	6		1	4	1	2	14
FNMN	6		1	5	2		
TOTAL	34	5	4	21	19	2	85

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